REMARKS/ARGUMENTS

Reconsideration of this application is respectfully requested.

Attention is also directed to the attached Form PTO-1449 and the granted EP patent. Copies of the first and second EPO examination reports issued are also attached. Clean copies of the examination reports can also be obtained by accessing .pdf information from the following web-site http://ofi.epoline.org/view/GetDossier?dosnum=&lang=EN which is open between Monday to Friday, 0:00 to 18:00 hrs, Central European Time.

The IDS fee for this stage of prosecution is also attached.

The rejection of claims 1, 4, 7 and 8 under 35 U.S.C. §103 as allegedly being made "obvious" based on Pruncal '570 in view of Huang '267 is respectfully traversed.

Pruncal does not relate to an optical regenerator per se. It is implicit that a regenerator seeks to restore the original characteristics of the optical signal (i.e., both pulse duration and the gap duration between pulses). Pruncal describes a scheme for a data compressor for an optical pulse train which compresses the spacing between optical pulses, i.e., it compresses a pulse train having a repetition time T to a pulse train having a repetition time t, where t is much less than T (see the Abstract, 1st sentence).

Accordingly, the optical gates 26, 28 in Pruncal receive alternate control signals of the same magnitude from the flip-flop 30 to enable the pulses to be compressed (see for example, column 2, line 50 to 54: "The binary control levels on output lines 32 and 34 are complementary so that when one optical gate is in the gating state, the other optical gate is in the blocking state,

and vice versa."). The output from gate 26 is then subject to a delay element 38 before the signal is recombined by coupler 40, which introduces a delay of T-t seconds (see column 3, lines 21 to 22). The delay effectively closes the gap between the pulses in the train so that the pulses now appear with a higher frequency, with successive stages of the compressor enabling higher pulse repetition rates in the output signal.

The present invention addresses the problem of how to regenerate an incoming optical signal when both the pulse duration and the pulse gap are very short (due to the high data rate) given the known limitations in the recovery time of the optical gates known in the art (see page 2, lines 25 to 29 of the specification). Signal regeneration implicitly requires reproducing the timing and information content of the signal, and is not the same as rapidly reducing the gap between pulses in a pulse train in the manner disclosed by Pruncal, in which a signal with a slow pulse repetition is input to the system and later output with a higher pulse repetition rate. Accordingly, faced with the problem of how to regenerate a signal which requires the optical gates to a function above their known recovery time for conventional signal input, a person skilled in the art would not consult Pruncal (either alone or in combination with Huang) to find a solution. Pruncal does not teach how a high-speed signal could be regenerated, only how a high-speed signal having a particular pulse duration could maintain its pulse duration but reduce the pulse repetition time (i.e., in Pruncal the relative duration of the pulses stays the same, only the gap between pulses is reduced). Accordingly, Pruncal teaches simply a method of reducing the gap between pulses. The incoming signal is split in Pruncal by coupler 20, which feeds the same data rate to each of optical gates 26. At no point in Pruncal is the inputted data rate reduced through each optical gate. Instead, the output of the two optical gates are combined in such a

way that in fact the outgoing signal will have a higher bit rate by virtue of the gap duration between pulses being reduced.

Nothing in Pruncal teaches that a high speed optical stream can be slowed into a plurality of parallel streams, each stream regenerated and then recombined collectively to produce a regenerated signal carrying the same information content. Pruncal only teaches that a pulse train can be outputted with a reduced gap duration between pulses.

Nonetheless, even if, as the Examiner suggests, Pruncal further fails to teach that each gate is arranged to receive a further data stream at its control input and that the interleaved regenerated optical signal is the bit rate of the original received signal, nothing in Huang would motivate a person skilled in the art to realize that the high speed signal can be regenerated in the manner claimed, and so there is nothing to motivate a person skilled in the art to consult Huang. In Huang, it is clear from column 7, lines 27 to 31 that the Sagnac switch regenerates the data pattern of the received data signal with the clock signal, but this is a feature generally known in the art for optical pulse signal regeneration.

It is respectfully submitted that the Examiner has clearly attempted an ex post facto analysis of the prior art documents, rather than to consider the problem which faced a person skilled in the art at the time of the invention, namely, how can an optical signal be regenerated in the case where its pulse duration at input (and inherently the pulse gap) is so short that the optical gate is unable to recover at the required speed. The inventors realized that although the functioning of an optical regenerator is limited by the recovery time of the optical gate, an optical regenerator can still incorporate such lower recovery time optical gates even when the

signals to be received have high bit-rate. This was commercially highly advantageous yet clearly had not been considered hitherto in the art, nor would a skilled person on reading any of the cited prior art have contemplated that such a solution was possible.

The rejection of dependent claims 2 and 5 under 35 U.S.C. §103 as allegedly being made "obvious" based on Pruncal/Huang in further view of Desurvire '322 is also respectfully traversed.

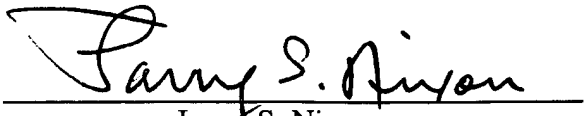
In view of the fundamental deficiencies of the primary and secondary references with respect to independent claim 1 as noted above, it is not believed necessary at this time to further detail the additional deficiencies of these references and of the tertiary reference with respect to these more detailed dependent claims 2 and 5.

Attention is also directed to new claims 9-15. These new claims are all dependent directly or indirectly on original claims and add yet further patentable distinction so they are also believed to be in fully allowable condition.

Accordingly, this entire application is now believed to be in allowable condition and a formal Notice to that effect is respectfully solicited.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: 

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AMENDMENTS TO THE DRAWINGS

Proposed drawing changes are shown in red on an attached copy of the originally filed drawings. A proposed substitute set of drawings incorporating such changes is also attached.

Attachment: Replacement Sheet(s)
Annotated Sheet Showing Changes

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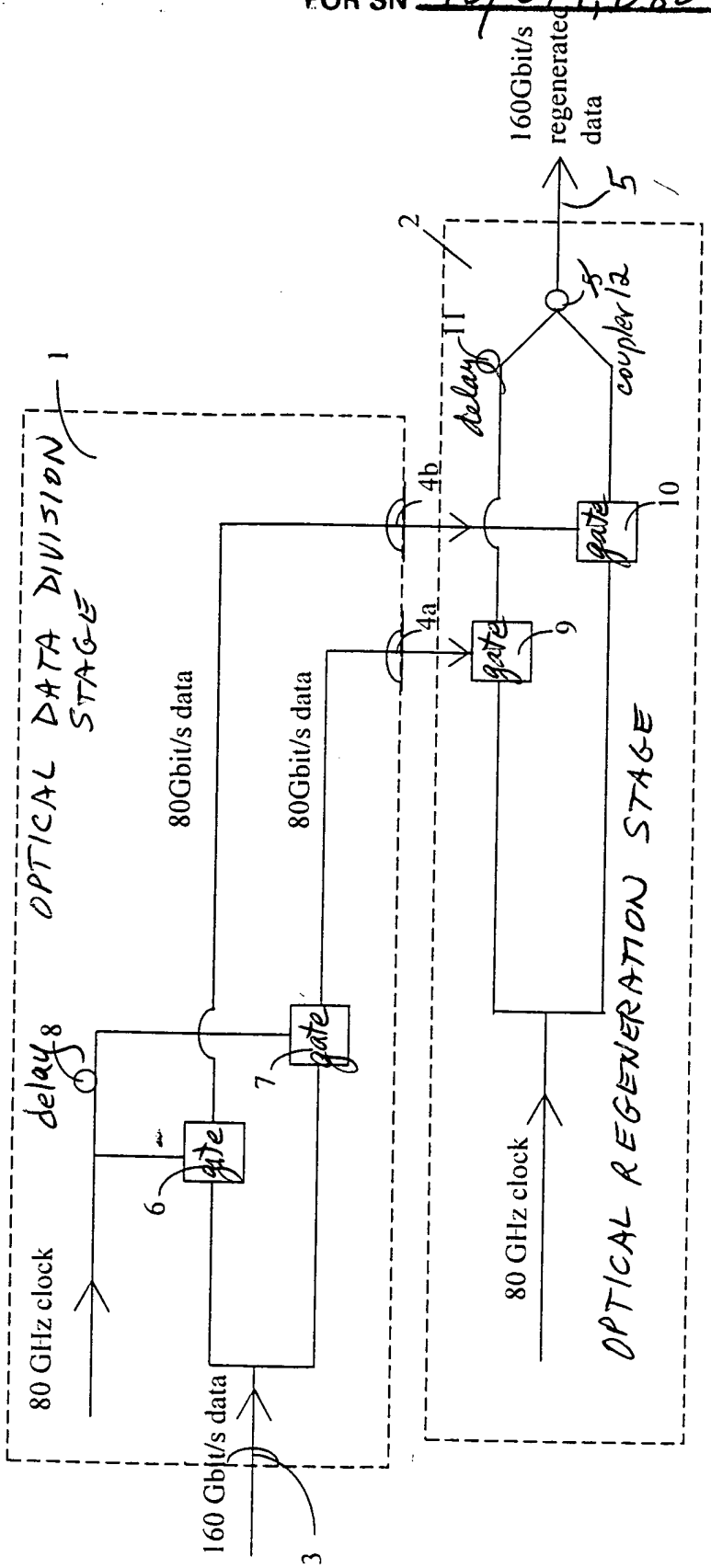
PROPOSED DRAWING AMENDMENTS

FOR SN 10/019,080

Figure 1



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PROPOSED DRAWING AMENDMENTS

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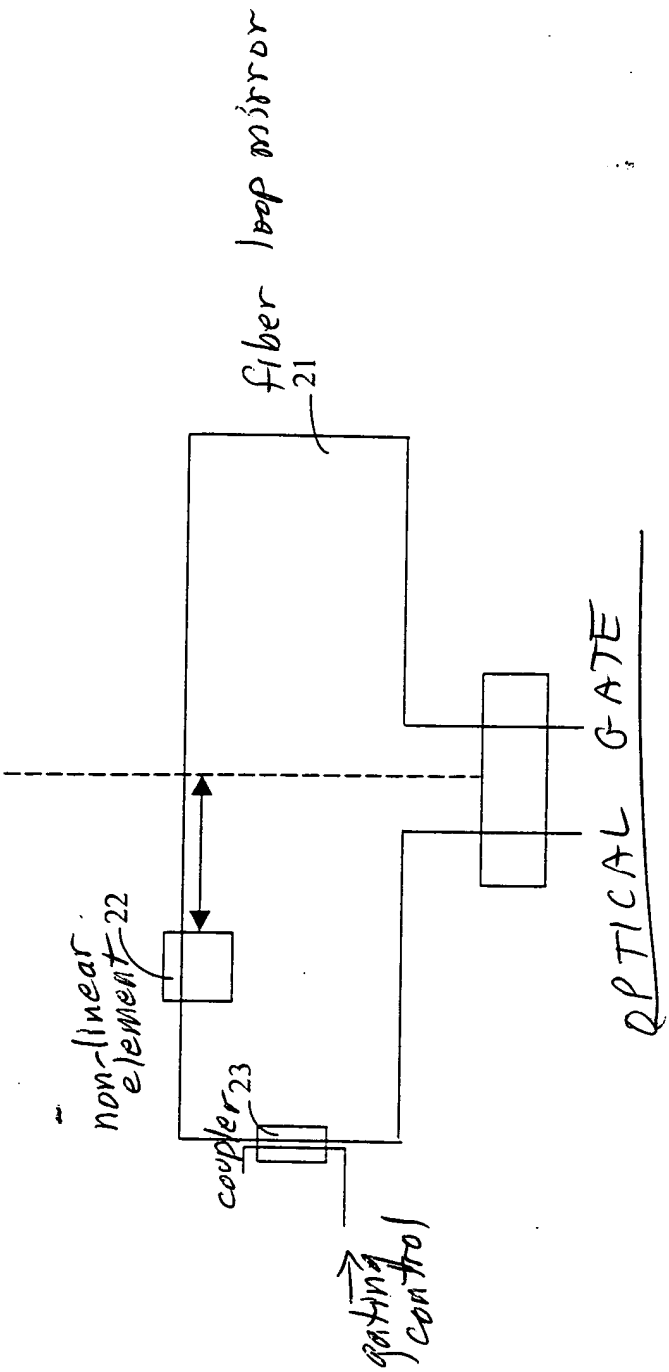

Figure 2

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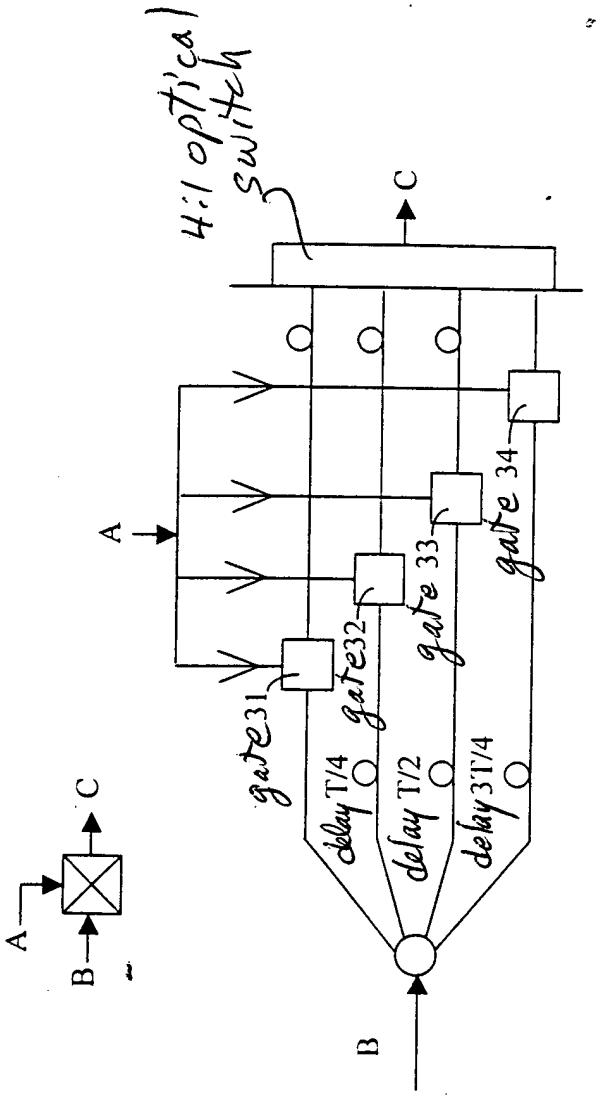

Figure 3